

A new *Altivasum* Hedley, 1914 (Turbinellidae, Vasiniae) from the coast of southern Western Australia

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ABSTRACT This paper presents a new *Altivasum* found off Jurien Bay, Western Australia at 60 m. This new species expands our understanding of the distribution, and in particular extends the northern range of *Altivasum*, in the South-west Marine Region. *Altivasum pauladellaboscae* n. sp. is more rhomboidal than *A. hedleyi* Maxwell and Dekkers, 2019, which is elongated, and has the formation of tubular spines on the shoulder of axial fold on the later whorls of the spire; these spines are not formed in *A. pauladellaboscae* n. sp. *Altivasum pauladellaboscae* n. sp. differs from *A. profundum* Dekkers and Maxwell, 2018 in having acute shoulder nodules. The South Australian, *A. flindersi* Verco, 1914 lacks the fibriated subsutural band found in *A. pauladellaboscae* n. sp. *Altivasum clarksoni* Maxwell and Dekkers, 2019 is geographically isolated and morphologically distinct, being more elongated and fibriated. This paper brings the number of described *Altivasum* species to five.

KEY WORDS *Altivasum*, *A. pauladellaboscae*, Western Australia.

INTRODUCTION

The South-west Marine Region is a bioregion identified for its significant and diverse subtropical and temperate faunal composition (Commonwealth of Australia, 2012). The description of the new species below completes the northern range of *Altivasum* within the Western Rock Lobster Ecological Zone of the South-west Marine Region. This northern section was hitherto without any *Altivasum* data (Abbott 1959; Dekkers and Maxwell, 2018; Maxwell and Dekkers, 2019). Within the Western Rock Lobster Ecological Zone, *Altivasum* is currently divided into two species, a shallow water *A. hedleyi* Maxwell and Dekkers, 2019 and a deep water *Altivasum profundum* Dekkers and Maxwell, 2018, to this a new species is added, which has a depth preference that falls between these two species.

The southern and eastern areas of the South-west Marine Region contains: *A. hedleyi* Maxwell and Dekkers, 2019 in the shores adjacent to the Albany Canyon group complex ecological zone; *Altivasum clarksoni* Maxwell and Dekkers, 2019 in the Recherche Archipelago ecological zone; and *A. flindersi* Verco, 1914 from the central gulf and Kangaroo Island Pool ecological zone. The South-west Marine Region is unique in that it holds all the known *Altivasum* species.

METHODS

Cray fisheries are an important component of the Western Australian economy. However, there is also a role for this fishery to act as citizen scientists, particularly when dealing with one aspect of the by-catch, being on the lookout for unusual shells occupied by hermit crabs. The

distribution of Western Australian *Altivasum* complex falls within the western rock lobster ecological zone (Commonwealth of Australia, 2012; Dekkers and Maxwell, 2018; Maxwell and Dekkers, 2019). The examples of the species being circumscribed in this paper were obtained as by-catch from cray-fisherman. The new species is described based on shell morphology and is compared to existing members of the *Altivasum* complex.

SYSTEMATICS

Superfamily: Turbinelloidea Rafinesque, 1815

Family: Turbinellidae Swainson, 1835

Subfamily: Vasiniae Adams and Adams, 1853

Altivasum Hedley, 1914

Type Species. *Latirus aurantiacus* Verco, 1895
(= *Altivasum flindersi* Verco, 1914).

Synonymy. *Altivasum* Hedley, 1914, p. 68.

Dekkers and Maxwell 2018, p. 246. Maxwell and Dekkers, 2019, p. 171. = *Vasum* (*Altivasum*)

Hedley - Wenz 1946, p. 1300. Abbott 1950, p.

213. Abbott 1959, p. 25. Wilson 1994, p. 60.

Assigned Taxa.

Altivasum clarksoni Maxwell and Dekkers, 2019 (p. 172)

Altivasum flindersi Verco, 1914 (p. 69)

Altivasum hedleyi Maxwell and Dekkers, 2019 (p. 172)

Altivasum profundum Dekkers and Maxwell, 2018 (p. 251)

Altivasum pauladellaboscae Cooper and Maxwell, new species
(Figures 1A, B)

Description. A medium sized rhomboidal *Altivasum* that possesses a uniformly fibriated subsutural band and not dissimilar to a hand-grenade in form. The shell is very heavy and solid. The teleoconch has 10-11 axial nodes that do not develop spines until the final body whorl.

Furthermore, teleoconch is decorated with four or five strong spiral cords that have finer threads in the inter-spaces. The suture is wavy and distinct. The shoulder of the body whorl has large axial folds that are nodulated with short open tubular spines. The axial folds are transgressed by strong cords that periodically give rise to short tubular scales at on the peak of the axial fold. The aperture is ovate and the lower columella bears there plicates. The operculum is of a tear drop in shape.

Type Material. Holotype – WAMS No. 29953, Jurien Bay, Western Australia, taken in crayfish pot at a depth of 60 m (to be deposited in the Western Australian Museum), height 128.2 mm (Figure 1A). Paratype – Jurien Bay, Western Australia, taken in cray fish pot at a depth of 60 m (Merv Cooper collection), height 129.3 mm (Figure 1B).

Type Locality. Jurien Bay, Western Australia, at a depth of 60 m.

Etymology. Named in honour of Paula Della Bosca. Paula was the partner of Merv Cooper in Perth Shell Distributors (sadly she passed away on 15th April 2018; she was a dedicated shell collector in the field; Figure 2).

Remarks. At present, the precise distribution of *Altivasum pauladellaboscae* new species is not known, recent examples have been taken off Jurien Bay at 60 m, but it known to range as far south as Rockingham (Figure 3). Live taken specimens are always camouflaged with coral growths and seaweed. This record expands our understanding of the distribution, in particular, *A. pauladellaboscae* extends the northern range of the *Altivasum*, and this encapsulates the remaining Western Australian area in the Southwest Marine Region remaining without an *Altivasum* species (Dekkers and Maxwell 2018; Maxwell and Dekkers 2019; Figure 3).

The two species that abut the distribution of *A. pauladellaboscae* come from different depths and locations, but are taxa found further to the south (Figure 3). *A. pauladellaboscae* differs from *A. hedleyi* Maxwell and Dekkers, 2019 in being more rhomboidal over the elongation of *A. hedleyi*. Furthermore, *A. hedleyi* can be differentiated by the much more ornate spire and formation of tubular spines on the shoulder of axial fold, these spines are not formed in *A. pauladellaboscae*. While *A. pauladellaboscae* and *A. hedleyi* share a final body whorl that may be spinose, this is typically greatly diminished in *A. pauladellaboscae* not reaching the relative large size of those in *A. hedleyi*.

Altivasum pauladellaboscae differs from *Altivasum profundum* Dekkers and Maxwell, 2018 in lacking the delicacy of that species: *A. pauladellaboscae* has shoulder nodules that are more acute than in *A. profundum* that does not possess the tubular spines of both *A. pauladellaboscae* and *A. hedleyi*.

The South Australian, *A. flindersi* Verco, 1914 lacks the fibriated subsutural band found in the Western Australian species. The small *A. clarksoni* Maxwell and Dekkers, 2019 differs in being much smaller, and has a much finer sculptural form than the smoother and coarsely ornamented shell of *A. pauladellaboscae*.

DISCUSSION

The naming of this new *Altivasum* brings the total number of species in that genus to five (Figure 3). The recent taxonomic expansion of the *Altivasum* complex has enabled a greater understating of the radiation to be enunciated. In particular, *A. pauladellaboscae* shares many similarities to both, *A. profundum* and *A. hedleyi*, and acts as a marker upon which to discuss the evolution within the *Altivasum* complex. All three species have differing depth profiles and it

is the difference in depth profile that is of great interest (Dekkers and Maxwell 2018). *Altivasum pauladellaboscae* is a mid-depth species. If we accept this with the shifts in sea-level and interglacial oscillations, then the modern shallow water taxa must have shared ancestry with the deep water sister taxa. The new species provides a marker to further the ability to formulate an evolutionary hypothesis for the radiation of the *Altivasum* complex: how the shallow watered *A. hedleyi* arose from the shared ancestor with the deeper watered *A. profundum* (Dekkers and Maxwell 2018).

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Figure 2. Paula Della Bosca.

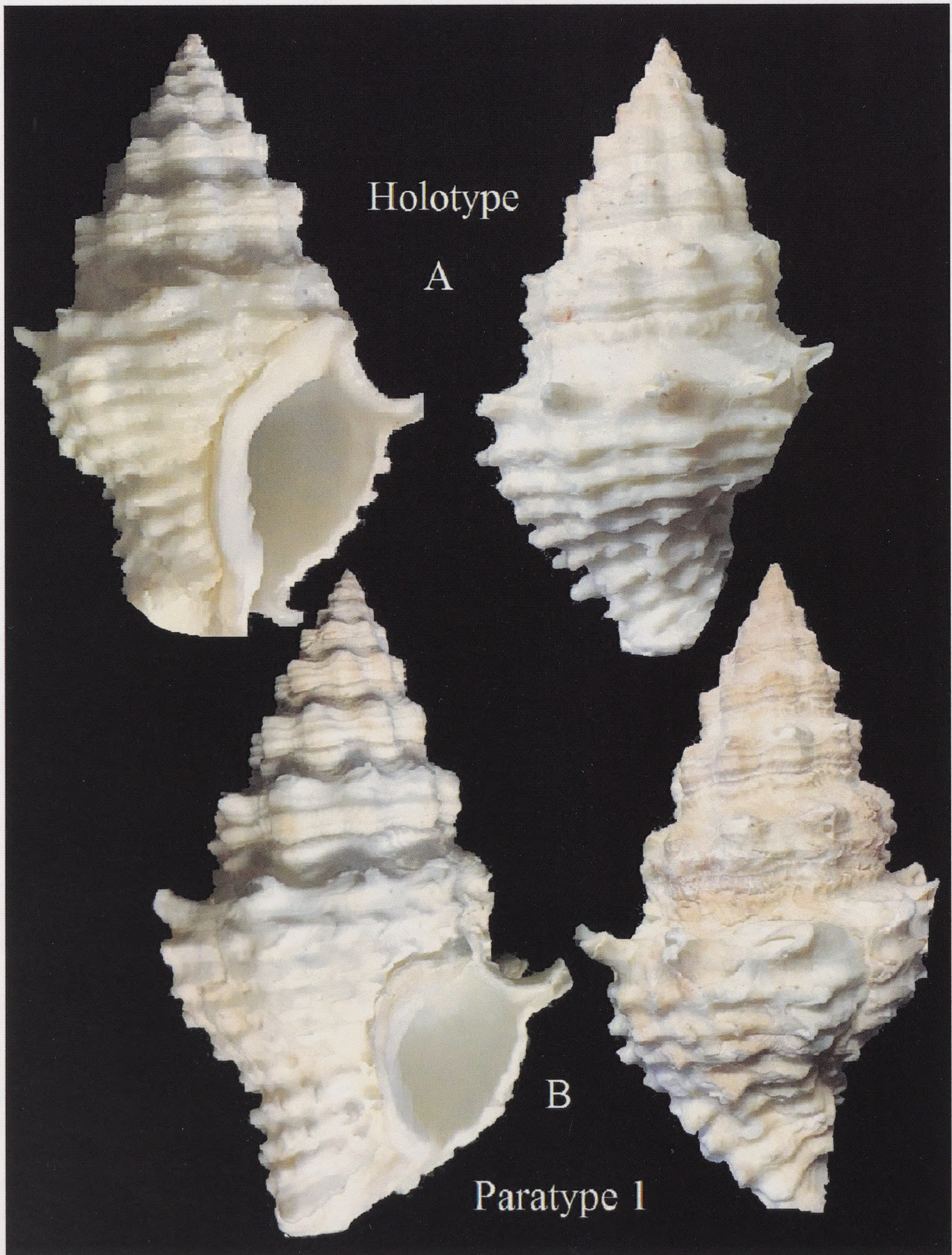


Figure 1. **A=** *Altivasum pauladellaboscae* – Holotype – Jurien Bay, Western Australia, taken in crayfish pot at a depth of 60 m (deposited in the Western Australian Museum, WAMS No. 29953), height 128.2 mm; **B=** *Altivasum pauladellaboscae* – Paratype 1 – Jurien Bay, Western Australia, taken in cray fish pot at a depth of 60 m (Merv Cooper collection), height 129.3 mm.

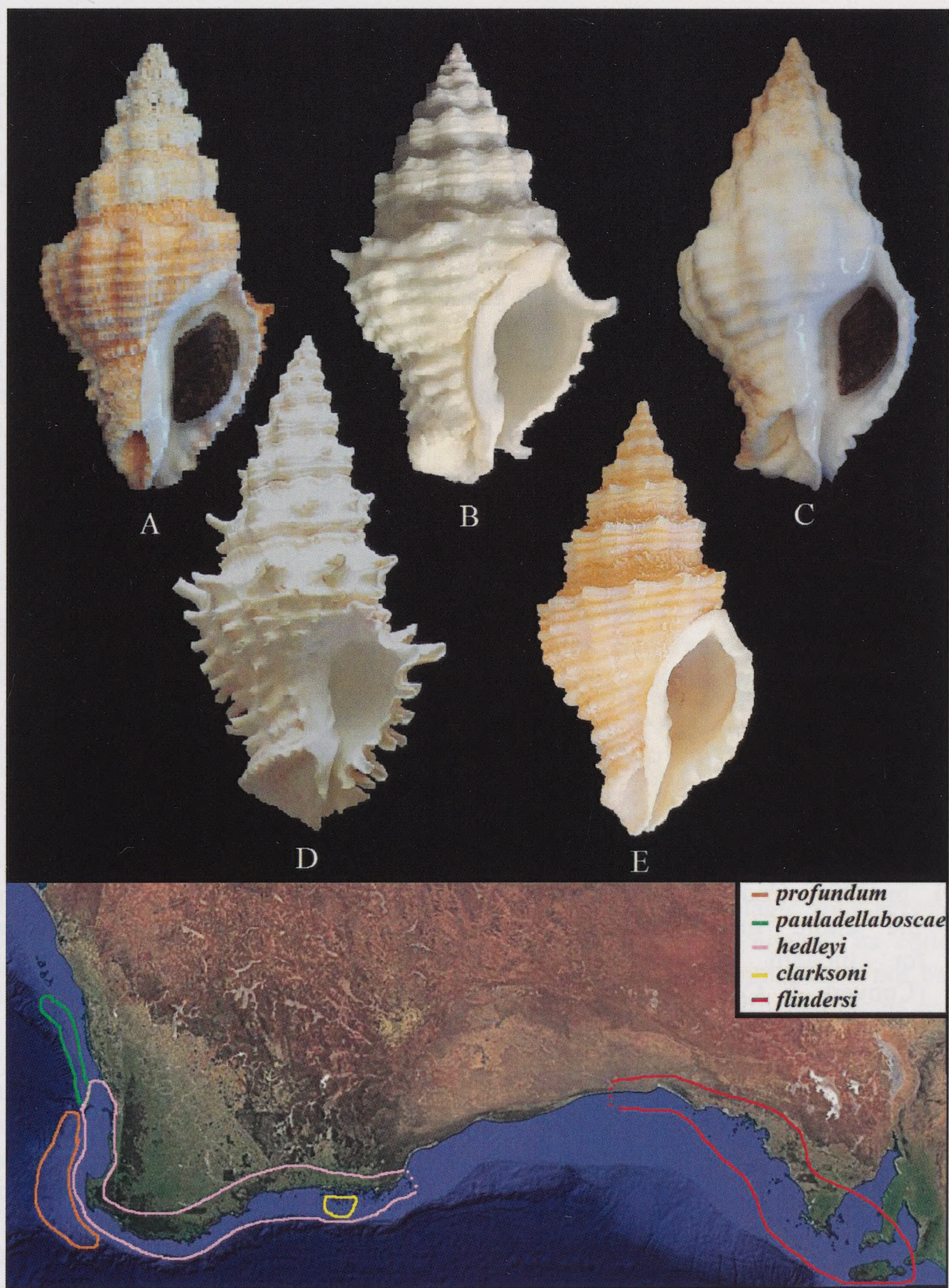


Figure 3. The current *Altivasum* Hedley, 1914 taxa showing their known distributions: **A**= *A. flindersi* Verco, 1914, Port Lincoln, South Australia, dived 10-20 metres in gravelly sand gutters (MNHN IM-2014-6965), height 110.3 mm; **B**= *A. pauladellaboscae* Jurien Bay, Western Australia, taken in crayfish pot at a depth of 60 m (deposited in the Western Australian Museum, WAMS No. 29953), height 128.2 mm; **C**= *A. profundum* Dekkers and Maxwell, 2018, off Augusta, West Australia, ROV collected at 162 m, (WAMS No. 72381), height 77.0 mm; **D**= *A. hedleyi* Dekkers and Maxwell, 2019, Esperance, Western Australia (Weinreich collection), height 222.0 mm; **E**= *A. clarksoni* Dekkers and Maxwell, 2019, Esperance, Western Australia, 30 m by diver (Collection of Trevor and Marguerite Young), height 62.0 mm.